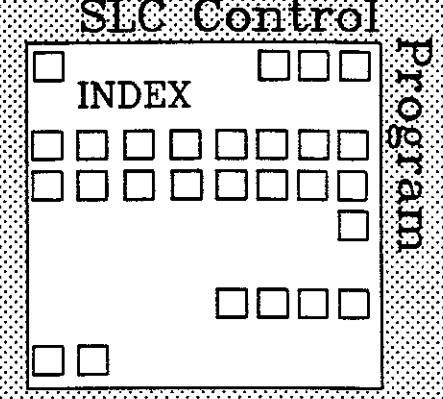
Index Panel

SLC's Software Engineering Newsletter



May 12, 1992 | All that Fits is News to Print | Vol. 6, No. 5

Ripple Checking for Magnets

March 25, 1992

Author: *Nan Phinney* **Subsystem:** *All* **User Impact:** *Small*
Panel Changes: *One* **Documents:** *No* **Help File:** *None*

Magnets and other Analog Control devices use either a Power Supply Controller (PSC) module or a Transiac DAC and Smart Analog Monitor (SAM) for control and read back. Both the SAM and the PSC provide filtering for 60 Hz ripple. In addition, the SAM and the PSC (type 1) modules provide a readback of the amplitude of the 60 Hz ripple seen. For full details on the ripple measurement circuitry and readback mechanism, refer to the SLC Hardware Manual.

With the SAM module, the ripple magnitude is encoded in a low order nibble of the floating point value, and the data is available each time the SAM is read. The PSC module must be switched from normal ADC Input mode to a special Ripple Input mode in order to read the ripple value. This requires delays for the ADC to settle so it is sampled only every few minutes by the micro checking software. For both devices, the ripple voltage is then converted to a current in amperes using the IVA polynomial in the database which specifies the volts to amperes conversion for that device. The resulting value is stored in the database as RIPL. This value has been available as a diagnostic from the single unit display or Dbdump for many years but there has been no routine flagging of devices with excessive ripple.

The new micro software sets the Bad_Ripple status bit (STAT = 2000 hex) for

1. PSC (type 1) controlled devices with RIPL greater than 1% of the current (IDES)
2. DAC/SAM devices with RIPL greater than twice the check tolerance

Ripple checking is not performed for the following devices:

1. PSC (type 2) controlled devices where ripple monitoring is not available (HDSC = 100 hex)
2. Stepping Motors (STEP, XMOV, YMOV)
3. PAUs, Kickers or other pulsed devices identified by the HDSC Triggered bit (HDSC = 800 hex)
4. NoControl devices with Trim disabled (HSTA = 400 hex)

Devices with excessive ripple will be indicated on the All Unit Displays by the text BADRIPL in Yellow if there is no more serious error text. A Bad Ripple summary display has also been added to the More Summary Displays panel available off the All Magnet Panel either from the main Index or any subsystem Index.

SIP Message Display Logic

March 19, 1992

Author: *Ralph Johnson* **Subsystem:** *Any* **User Impact:** *Some*
Panel Changes: *No* **Documents:** *No* **Help File:** *No*

Summary Information Process (SIP) messages are traditionally displayed in a scrolling fashion on various CUD displays. Before now, a new message would be appended to the bottom of the list and the oldest message would be removed from the top. The facility has been upgraded to provide several alternatives for displaying new messages. These new message behaviors may be specified for a summary, group of devices in a summary, or for individual devices. The following display options are available:

- REPLACE - This causes any old message of a particular device to be removed and the new message to be appended to the list of messages.
- REMOVE - This causes any old message of the device to be removed from the list. If the severity of the device is now "ok", no new message will be appended to the list. All severities other than "ok" will have a message appended. The effect is that messages will appear when a device faults and disappear when the fault clears.
- REMOVE_LATER - This behaves like the REMOVE option except that when a device severity returns to "ok" and the corresponding error message has not been in the list for 20 seconds, an "ok" message will be appended for the remainder of the interval and will then be removed. This gives some "persistence" when a device faults and then quickly returns to "ok".
- ADD - This is the default and is the way that the messages have previously been managed. All new messages are appended to the list and no consideration is given to old messages.

This logic is specified in the summary definition files by using the qualifier "/MSG_LOGIC=*value*" where *value* is one of the above items (eg. /MSG_LOGIC=REMOVE). This qualifier can be used in a line which specifies a device in a summary (DEFSUMYline) or a line which specifies a summary (SUMMYMON line).

At present the ion chamber messages are displayed with the "REMOVE" option. That is, a message appears when they fault and is removed when they clear. The logic for other types of devices will be changed later.

Exclusive-Access Interlocks for Wires and Beam Scans

March 31, 1992

Author: *Ed Miller* **Subsystem:** *Accelerator* **User Impact:** *Small*
Panel Changes: *Few* **Documents:** *No* **Help File:** *Yes*

The wire and beam scan software is now set up to prevent simultaneous control by more than one application at the same time. For wire scanners, the granularity of the interlock is over all the wires controlled by the same micro. For beam scans, only the auto-collide operation is interlocked.

If you initiate a wire scan operation when another process (typically, another SCP) is currently scanning using wires in the same micro, you will get a message indicating that another process is blocking you. The message will also identify that process by name and by process id (PID). Then your wire scan request will abort (by default).

There may be instances when you would prefer to wait for the block to be released, rather than aborting immediately. You can control this behavior with the BLOCKED LOCK WAIT button on the SCAN OPTIONS panel. Setting a non-zero value with this button will cause your SCP to wait when blocked for up to the specified number of seconds; if the block is released by the other process sooner, your wire scan will proceed (with an informational message); if not, it will abort (with a timeout message). Note that the wait can be aborted at any time with control-C, so it is sensible to specify a long timeout value, even for interactive use.

There is a potential for a process to obtain an interlock and block all other processes which need that resource *forever*. This may happen, for instance, if there is a coding error which results in an interlock being acquired but never released. The ways to deal with this eventuality are described in the HELP for the "Blocked Lock Wait" button. The simplest (and usually effective) method is to EXIT (or, if necessary KILL or STOP) the blocking process.

Currently exclusive-use interlocks are implemented for the following:

- EMIT, SKEW, and ESPD measurements
- Single scans for any wire
- Beam scans initiated with Auto Collide

Note that if a correlation plot application performs any of the above operations, all the necessary interlocks will be acquired before the application data collection begins, and all will be released after all data collection completes. (An exercise for the student: describe a scenario involving correlation plots where two SCP's could encounter a deadlock, that is, each is waiting for an interlock held by the other, potentially forever. Your scenario should NOT depend on any split-second timing assumptions between unrelated processes.)

Improvement to Resetting Fast Feedback Actuators

March 17, 1992

Author: *Stephanie Allison* **Subsystem:** *Fast Feedback* **User Impact:** *Small*
Panel Changes: *None* **Documents:** *No* **Help File:** *None*

The RESET ACTUTR function on the FEEDBACK PANEL has been improved so that it works properly when the loop is in FEEDBACK mode. To make the function work correctly in the past, operators had to first put the loop in COMPUTE mode, hit RESET ACTUTR, and then restore the loop to FEEDBACK. Now the RESET ACTUTR button may be hit at any time regardless of the loop status.

Resetting actuators results in the following action by the software:

1. The actuator values are set to the reference values saved when the loop gold orbit was saved.
2. When the loop is not in FEEDBACK, the VAX simply trims the actuators to the new values.

3. When the loop is in FEEDBACK, the feedback loop itself will ignore its current actuator calculation and instead set the actuators to their reference values for about a second (longer for slower actuators).

Resetting CAR Error Counters

April 1, 1992

Author: *Greg Sherwin* **Subsystem:** *Accelerator* **User Impact:** *Small*
Panel Changes: *Few* **Documents:** *No* **Help File:** *None*

Previously, whenever the CAR COUNTER DISPLAY was selected from the NETWORK INDEX panel, the current CAR errors were set to zero automatically. Whenever the operator returned to the CAR counter display after looking at the next or previous page of the display, or performed some other SCP function and returned to the display, the numbers in the CURRENT GOOD and CURRENT BAD columns would all be zeroes.

To remedy this, a new button [ZERO CAR ERRORS] has been added to the ALL MICROS PANEL. Setting the current CAR errors to zero has been disabled in favor of this new button. To zero the current CAR errors the operator now must select this button, and upon doing so the current CAR errors for all micros are automatically zeroed following a query.

Similarly, the button [CLEAR CAR TOTALS] in the ALL MICROS PANEL has been functionally altered so that, upon selection and following a query, the operator can automatically clear the total CAR errors for all micros. Previously selection of this button required the operator to enter a specific micro and unit number for each CAR to be cleared.

Additionally, selecting the ZERO CAR ERRORS or CLEAR CAR TOTALS button will update the timestamps in the PREVIOUS ZERO and LAST CLEAR OF TOTALS columns of the SCP display respectively.

SCP Summary Displays

March 17, 1992

Author: *Ralph Johnson* **Subsystem:** *Any* **User Impact:** *Small*
Panel Changes: *None* **Documents:** *No* **Help File:** *No*

When an access is made using the access procedures, various sets of devices are marked as disabled for the purposes of CUD message displays and summary boxes. However, the summary displays which are available on a SCP normally continue to include these marked devices. It is now possible to exclude those devices which are marked to be ignored by adding a qualifier to the device definitions contained in the summary display definition files.

To ignore a device, include "/DISABLED=IGNOR" in any line which specifies a summary device (*i.e.* a "SUMYDEV" line). Likewise, to ignore all devices in a summary, include "/DISABLED=IGNOR" in the "SUMYDISP" line which specifies the summary box.

SIP Errorlog messages

March 19, 1992

Author: *Ralph Johnson* **Subsystem:** *Any* **User Impact:** *Some*
Panel Changes: *None* **Documents:** *No* **Help File:** *No*

When the SIP process detects a change in the severity of a device, it causes an errorlog message to be generated. Previously all messages had the severity level of error. Now messages generated when a device changes to "OK" will be of an informational severity level.

New Collimator Display

Mar 11, 1992

Author: *Sandra Bes* **Subsystem:** *Touch Panel* **User Impact:** *Small*
Panel Changes: *Few* **Documents:** *No* **Help File:** *None*

Plots that display a summary of all collimators in a micro region are now available from the SCP. The 'Collimator Summary Display' contains three plots: the top-most plot shows the position of all X collimators in that micro relative to the center of the beam pipe, the middle one shows the position of all Y collimators, and the bottom plot presents the ion chamber readings that correspond to each collimator.

The spacing of the collimators in the display represents their relative positions along the beam line. This display is available for Linac, Arc and Final Focus collimators.

Polarization Watchdog

May 6, 1992

Author: *Ron Chestnut* **Subsystem:** *Polarization* **User Impact:** *None*
Panel Changes: *Few* **Documents:** *No* **Help File:** *No*

The Polarization Watchdog is a slow feedback loop which monitors output from PL01 and the mode of the circular polarizer. While collecting data for ring buffering in PL01, the four polarization states, Error, Right, Left and Zero, are counted. These counts are updated in the database once every 30 seconds and are thus available to the VAX.

The loop sets up the status used by the summary display as follows:

Status	Color	Description
NOT RNDM	Yellow	Circular polarizer in manual or pattern mode
ERR > 1%	Yellow	Some Error states were found
ERR > 10%	Red	Errors exceeded 10%
PL01 OFF	Red	No new data from PL01
BAD L/R	Red	Left/Right ratio not 50% ± 10%

The polarization state counters, and hence the L/R ratio, can be seen on the PL01 data acquisition status or from the CIRP status display. The CIRP status also shows the mode and pattern of the polarizer.